

# TECHNOLOGY



## Sundial

### SEQUENCE 1

Age group	10-12 y.o.
Prior knowledge	None
Material needed	The "Sundial" box
Subjects	Time
Skills involved	Problem-solving, communication, learning to learn
Time to carry out the sequence	1h

#### Step 1: Discovering the content of the box

This first step aims at having pupils look at the box content: the material and the notice. The teacher should lead all children to participate in the creation of the sundial and express their opinion on how to build it.

#### Step 2: Understanding what was built

Ask your pupils to reflect on what they built. What is it? How does it work?

Sundials were invented many millennia ago. Some even date back to ancient Egypt and Babylonian history! A sundial uses the sunlight to indicate time and were actively used up until the Middle Ages. They are not very precise and cannot indicate the exact time since the position of the sunlight varies depending on the time of the year, still, they were widely used before the invention of modern clocks.



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# TECHNOLOGY

You may still find some sundials today. Even if they have become less frequent, they have become more and more spectacular. For example, the Castillon Dam in France is the largest sundial in the world as it is 94m high and 200m wide!



Figure 1 Castillon Dam, 2012

## Step 3: Adding the time

How can you read the time on this object? Mark the hours on your sundial!

Sundials, just like the one you created, are made of two major components: a plate with the time written on it, and a gnomon, which is the bar that casts the shadow that indicates time. The length and direction of the shadow may vary depending on the time of the year, but nothing else that the absence of light will prevent a sundial from working.

Sundials can be put against a wall (with a horizontal gnomon) or directly on the ground (the gnomon being vertical in that case). More recent sundials aim at correcting the lack of precision of the original design by creating an adapted timescale with the use of maths!



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# TECHNOLOGY

For more advanced pupils, you may also ask them to open the box without looking at the notice at first. Explain what a sundial is, and ask your students to build one – still without the help of the notice. Once they believe they are done, let them have a look at the notice. Did they succeed in their task? What could they have done better, or differently?

## References

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# TECHNOLOGY

## SEQUENCE 2

Age group	10-12 y.o.
Prior knowledge	None
Material needed	The "Sundial" box
Subjects	Time, History
Skills involved	Written and oral expression; presenting skills; digital literacy
Time to carry out the sequence	1-2h

### Step 1: Introduction of the topic

The teacher introduces the topic of time measuring, leading a discussion with the pupils: How can we measure time? (with a clock, a watch, by observing the sunlight throughout the day) How can you tell the time with the sun? Do you know an instrument to tell the time by observing the sun? The teacher introduces then the concept of the sundial: what is it, what are its parts (the gnomon and the dial plate).

### Step 2: Draw a sundial

The teacher invites the pupils to draw a sundial and compare their production. The teacher then leads a discussion on how the sundial will work.

### Step 3: Research and presentation

The pupils realize a short research on different types of sundials online or in books. After the research phase, the pupils create a short presentation (10-15 minutes) about their findings for the whole class.

### Step 4: Lesson

Building on what the pupils presented, the teacher gives a short lesson on the sundial. This part can include history, geography, and art: when the sundial was invented,



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# TECHNOLOGY

which civilizations used it and its cultural significance. Examples could include ancient Egypt, ancient Greece, the Roman Empire...

## Step 5: Building our own sundial

Using the materials in the box, the teacher guides the class to build the sundial. The teacher should guide the pupils in the discovery of the content of the box, showing which part will constitute the gnomon, which part will be the dial plate, etc. The teacher should encourage each child to participate. Once the sundial is built, it becomes the sundial of the whole classroom: the teacher and the pupils decide together on where to place the sundial to observe it work (this could be for example the school garden). In doing so, the teacher should guide the pupils in reflecting on the best spot to make the sundial work (considering sun exposure, a flat surface, etc.).

Once the sundial is installed, the teacher can gather the kids around it and facilitate a group discussion about the similarities and differences between the sundials they researched and the one they built.



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